

THE CLAIMS

What is claimed is:

1. A method for producing an adhesive surface on a substrate which can be bonded to another substrate comprising:
 - treating the surface by wet chemical etching to remove an oxide layer and to provide a hydrophobic surface; and
 - exposing the etched hydrophobic surface to a gaseous ozone atmosphere to provide a dry hydrophilic surface.
2. The method according to claim 1 wherein the wet chemical etching includes an aqueous hydrofluoric acid solution (HF) as an etchant.
3. The method according to claim 1 further comprising the wet chemical etching includes an etchant that includes hydrofluoric acid (HF), ammonium fluoride (NH₄F) and water.
4. The method according to claim 1 wherein the duration of wet chemical etching is in the range of about 5 seconds to about 30 minutes.
5. The method according to claim 1 wherein the temperature of wet chemical etching is in the range of between about room temperature to about 80°C.
6. The method according to claim 1 wherein etching comprises immersing the substrate into a bath and wherein exposing the etched surface comprises removing the substrate from the bath to contact a gaseous ozone atmosphere of a container volume.
7. A device for producing an adhesive surface on a substrate which can be bonded to another substrate comprising:
 - a bath with an etchant for removing an oxide layer from the surface of the substrate and to produce a hydrophobic surface; and
 - a container having an inner volume that encompasses the bath, the inner volume also including a gaseous ozone atmosphere to produce a dry hydrophilic surface.

8. The device according to claim 7, wherein the container is sealed.
9. The device according to claim 8 further comprising an ozone generator coupled to the sealed container.
10. The device according to claim 7 further comprising at least one of a wafer holder, a sensor associated with the bath, a heating element coupled to the bath, and an outlet coupled to the container.